What is claimed is:

1. A fuel injection system in a gas turbine engine, comprising:

an annular combustion chamber centered about a central rotational axis of the engine;

a centrifugal compressor having an impeller centered about the central rotational axis, the impeller having a contoured rear surface substantially opposite an air-receiving front surface, the rear surface having a radially outboard portion defining a first lip protruding into a circumferential opening defined by the annular combustion chamber; and

a fuel supply line having a fuel release point proximate a portion of the rear surface radially inboard from the first lip, the rear surface, the first lip, and the circumferential opening defining a flow path for fuel to flow from the fuel supply line into the combustion chamber.

2. The fuel injection system of claim 1,

wherein the first lip and circumferential opening are radially outboard at least one eighth of an overall diameter of the engine.

3. The fuel injection system of claim 1,

wherein the portion of the rear surface is substantially concave with respect to a view exterior to and facing the rear surface along the central rotational axis.

4. The fuel injection system of claim 1,

wherein a junction of the portion of the rear surface and the first lip defines a cup surface, which is concave with respect to a view directed outboard and exterior to and facing the cup surface.

5. The fuel injection system of claim 4,

wherein the cup surface defines a centrifugal fuel trap in a portion of the flow path for fuel to flow from the fuel supply line into the combustion chamber.

6. The fuel injection system of claim 1,

wherein the combustion chamber includes an inboard liner and an outboard liner, and further comprising:

a stationary outer casing outboard of the outboard liner, the casing having a front side wall extending radially inboard and disposed between

a distal end portion of the impeller outboard of the first lip, and

the outboard liner of the combustion chamber;

wherein the front side wall defines a second lip at a radially inboard end of the front side wall, the second lip being proximate and substantially parallel to the first lip.

7. The fuel injection system of claim 6,

wherein the front side wall of the outer casing and the outboard liner of the combustion chamber define a first flow path for air flowing into the combustion chamber from the compressor, and

wherein the distal end portion of the impeller and front side wall of the outer casing define a second flow path for air flowing into the combustion chamber from the compressor.

8. The fuel injection system of claim 7,

wherein the first and second flow paths are disposed to direct airflow proximate the first lip to control a trajectory of fuel flowing from the first lip into the combustion chamber through the circumferential opening.

9. The fuel injection system of claim 8,

wherein the trajectory forms an angle measured outboard from the central rotational axis, the angle being in the range of zero to forty-five degrees.

10. The fuel injection system of claim 7,

wherein the front side wall defines at least one channel between the first and second flow paths for air flowing into the combustion chamber from the compressor.

11. A gas turbine engine, comprising:

an annular combustion chamber centered about a central rotational axis and defining a circumferential opening for receiving fuel;

a centrifugal compressor having an impeller centered about the central rotational axis, the impeller having a contoured rear surface substantially opposite an air-receiving front surface; and

a fuel flow delivery means for injecting fuel into the annular combustion chamber along the contoured rear surface and though the circumferential opening.

12. The gas turbine engine of claim 11,

wherein the contoured rear surface includes a radially inboard portion, and further comprising a fuel supply means for releasing fuel proximate the radially inboard portion of the rear surface.

13. The gas turbine engine of claim 12,

wherein the radially inboard portion of the rear surface is substantially concave with respect to a view exterior to and facing the rear surface along the central rotational axis.

14. The gas turbine engine of claim 11, further comprising:

a centrifugal fuel trap means incorporated into the fuel flow delivery means for accumulating fuel on the contoured rear surface proximate the circumferential opening.

15. The gas turbine engine of claim 11,

wherein the combustion chamber includes an inboard liner and an outboard liner, and further comprising:

a stationary outer casing outboard of the outboard liner, the casing having a front side wall extending radially inboard and disposed between

a distal end portion of the impeller outboard of the fuel flow delivery means, and

the outboard liner of the combustion chamber;

wherein the front side wall, outer liner, and impeller collectively define a means for injecting air flow from the compressor into the combustion chamber.

16. The gas turbine engine of claim 15,

wherein the front side wall of the outer casing and the outboard liner of the combustion chamber define a first flow path for air flowing into the combustion chamber from the compressor, and the distal end portion of the impeller and front side wall of the outer casing define a second flow path for air flowing into the combustion chamber from the compressor.

17. The gas turbine engine of claim 16,

wherein the front side wall defines at least one channel between the first and second flow paths for air flowing into the combustion chamber from the compressor.

18. The gas turbine engine of claim 11, further comprising:

a fuel trajectory control means for directing airflow from the compressor to control a trajectory of fuel flowing from the fuel flow delivery means into the combustion chamber through the circumferential opening,

wherein the trajectory forms an angle measured outboard from the central rotational axis, the angle being in the range of zero to forty-five degrees.

19. The gas turbine engine of claim 11,

wherein the circumferential opening is radially outboard at least one eighth of an overall diameter of the engine.

20. A method for injecting fuel into a gas turbine engine combustor, comprising:

supplying fuel in a fuel line,

releasing fuel from the fuel line at a release point proximate a rear surface of a compressor-impeller, the rear surface being substantially opposite the air-receiving front surface of the compressor-impeller, the release point being at a first radially inboard position,

directing a fuel flow from the release point along the rear surface of the compressor-impeller outboard to a lip defined by the rear surface, the lip being substantially radially outboard of the first radially inboard position,

injecting the fuel flow from the lip through a circumferential opening defined by the combustor.

21. The method of claim 20,

wherein the circumferential opening is radially outboard at least one eighth of an overall diameter of the engine.